Whey proteins promote post prandial positive nitrogen balance in a muscle wasting situation but probably for a too short period of time to translate into muscle sparing

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Background

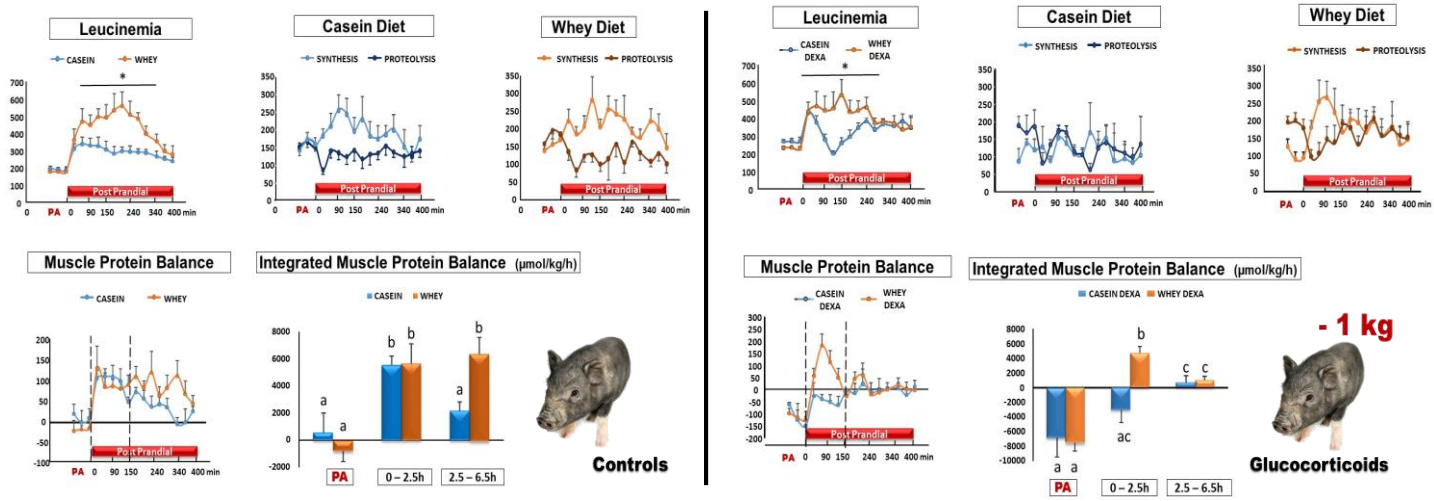
Muscle wasting occurred by an imbalance of muscle protein metabolism. Most of catabolic states are characterized by both an insulin and amino acid resistance which result into a food intake inefficiency to promote positive nitrogen balance during the post prandial period. So far, fast digested proteins (i.e whey) have been shown to be more efficient than casein to promote a stimulation of muscle protein synthesis (PS) in such situations; however, muscle mass is rarely improved.

Our hypothesis is that this stimulation occurs only for a short period of time in the fed state, which remains insufficient to induce a significant increase in muscle mass. To address this point, a protein synthesis and and proteolysis (PRO) kinetic study at the muscle level is required.

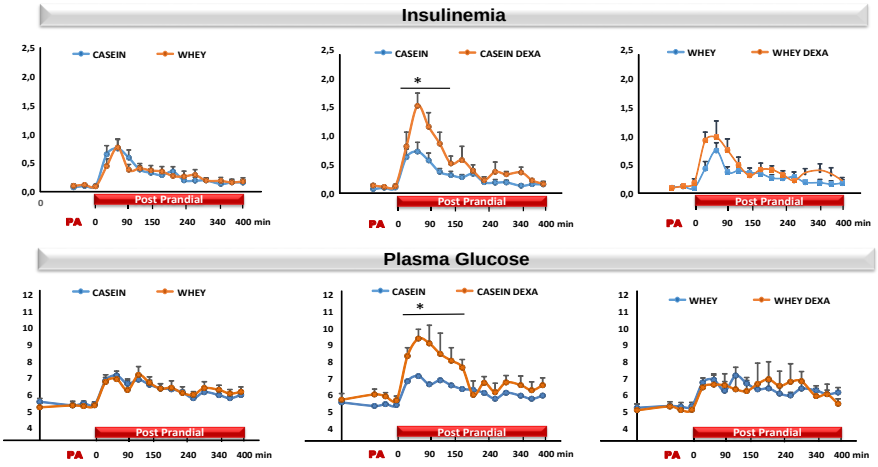
Methods

Adult mini pigs were catheterized into both the femoral artery and vein and infused with ^{13}C Phe to assess continuously muscle protein synthesis and proteolysis.
The catabolic state was induced by glucocorticoid treatment (8d); both casein and whey effects on PS and PRO were tested over time for 6.5 h.

Results



Our results confirmed that in catabolic situations, a positive muscle protein balance occurred only for a short period of time in the fed state with whey, which probably remains insufficient to induce a significant increase in muscle mass.



Whey protein diet was able to counteract the hyperglycaemia and hyperinsulinemia (insulin resistance) associated with the catabolic state

Conclusions

Whey protein diet was able to decrease the insulin resistance- associated with the catabolic state

Whey proteins allowed to restore a positive nitrogen balance but only for a short period of time

Need of complementary strategies to prolonged the duration of the whey-induced anabolism during catabolic states in order to translate in efficient muscle mass sparing